UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

In the Matter of Formosa Plastics Corporation, Texas P.O. Box 400 Point Comfort, Texas	))) Docket #VI-001(h)-90-H))))

ADMINISTRATIVE ORDER ON CONSENT

I. DELEGATED AUTHORITY

A. This Final Administrative Order on Consent ("Order") is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Section 3008(h) of the Solid Waste Disposal Act ("RCRA"), and further amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §6928(h).

B. The authority to issue such Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32; and a further delegation was made from the Administrator of Region 6 to the Region 6 Director of the Hazardous Waste Management Division ("Director") by Delegation Nos. 6-8-31 and 6-8-32.

II. USE OF GENDER

In this Order the use of the masculine gender includes the feminine and vice versa.

III. PARTIES

A. This Order is entered into by the United States Environmental Protection Agency pursuant to Section 3008(h) of RCRA, 42 U.S.C. §6928(h), and by Formosa Plastics Corporation, Texas, (Respondent), Point Comfort, Calhoun County, Texas.

B. Respondent consents to the issuance of this Order and to its terms, and Respondent agrees to undertake all of the actions required by the terms and conditions of this Order. Further, Respondent consents to the entry of this Order pursuant to Section 3008(h) of RCRA without a "Hearing on the Order". Respondent admits to EPA's authority and jurisdiction to: issue this Order; to compel compliance in any subsequent enforcement proceedings, either administrative or judicial; and to require Respondent's full or interim compliance with the terms of this Order. Finally, Respondent admits to EPA's authority and jurisdiction to impose sanctions for violations of this Order.

C. By consenting to the issuance of this Order or by complying with its provisions, Respondent does not admit the truth of any fact or any legal finding or determination asserted herein, other than those necessary to establish and acknowledge EPA's authority as described in the preceding paragraphs. Neither this

Order nor any part thereof shall constitute any evidence, admission, or adjudication of any wrongdoing, misconduct, liability, responsibility, or estoppel on the part of Respondent, or any director, officer, employee, or affiliate thereof, except as evidence for purposes of enforcement of this Order. For purposes of this proceeding or proceedings to enforce this Order or to impose sanctions for violations of this Order only, Respondent expressly waives its rights to request a hearing on any issue of law or fact set forth herein and consents to the entry of this Order. The undersigned representative(s) for each Party certifies that he/she is fully authorized by the Party whom he/she represents to enter into the terms and conditions of this Order, and to legally bind the Party he/she represents to this Order.

IV. NO FEDERAL WARRANTY

The EPA does not, by its consent to the entry of this Order, warrant in any manner that Respondent's complete compliance with this Order will result in future compliance with the provisions of the Solid Waste Disposal Act or the Resource Conservation and Recovery Act or any other law, statute, rule or regulation or any amendments to same. Notwithstanding EPA's review and approval of any plans formulated pursuant to this Administrative Order on Consent, Respondent shall remain solely responsible for compliance with the terms of RCRA and the Solid Waste Disposal Act and any and all amendments thereto except as expressly excused herein. EPA's approval of any workplans, reports, plans or other documents

submitted under this Order shall not be construed as a warranty or guarantee that the approved plans, etc. will result in compliance with this Order.

V. APPLICABILITY

This Administrative Order on Consent shall apply to and be binding upon the Respondent, as well as its successor and assigns. The Respondent is responsible for ensuring the compliance of its officers, directors, agents, employees and servants with this Administrative Order. Respondent shall give notice of this Administrative Order to its successor in interest no later than 30 days prior to the transfer of ownership or operation of the whole or any part of the Site, and shall provide a copy of this Administrative Order to any successor in interest. Respondent shall contemporaneously verify to EPA that such notice has been given. Respondent shall simultaneously give written notice to all parties to this Administrative Order, as well as to the TWC and EPA, of any successor in interest at least 30 days prior to any such transfer.

VI. FINDINGS OF FACT AND CONCLUSIONS OF LAW

Without a hearing or presentation of testimony, the Director has found the following:

A. Formosa Plastics Corporation, Texas, (Respondent) is incorporated under the laws of the State of Delaware and is authorized to do business in the State of Texas wherein it has located a production facility in Point Comfort, Calhoun County.

B. Respondent is a base production facility, and as such produces polyvinyl chloride (PVC) powder from polymerized vinyl chloride monomer (VCM), the production of which occurs in a two-stage bulk polymerization process.

1. In the first stage of production it produces ethylene dichloride (EDC).

2. EDC is produced by two methods: direct chlorination and oxychlorination. The latter method produces EDC by utilizing hydrochloric acid (HCl) recovered during the subsequent production of VCM.

3. In the direct chlorination method, chlorine is mixed with ethylene and heated in a reactor unit, this process yields, inter alia, EDC.

4. In the oxychlorination method HCl, (produced in the subsequent production of VCM) and oxygen react with ethylene to produce EDC. Temperatures are higher in this process than those in the direct chlorination method. The process yields, along with EDC, water, produced by the recovery of heat as steam, and other effluent.

5. Both of these processes are followed by a purification step which is a distillation process yielding ethylene dichloride (EDC). During the distillation of EDC, pure EDC and EDC heavy ends (sludge) is produced. EDC heavy ends is a K019 listed hazardous waste, 40 CFR §261.33.

6. Purified EDC resulting from both direct chlorination and oxychlorination is sent to a "cracking" furnace where separation of the EDC chemical bonds ("cracking") occurs.

7. This "cracking" results in the production of vinyl chloride monomer (VCM) and HCL.

8. Following the "cracking" process, the crude VCM is distilled after first being separated from the HCl. The VCM distillation process produces inter alia, VCM and VCM distillation heavy ends (sludge). VCM heavy ends is a K020 listed hazardous waste, 40 CFR 261.33.

9. The VCM is purified and then polymerized in suspension polymerization reactors to produce polyvinyl chloride (PVC) pellets.

10. Respondent began construction of the facility in June, 1980, and began operation in December, 1982.

11. Pursuant to RCRA §3010, Respondent has filed the notification required of generators of hazardous waste.

12. As a part of its facility, Respondent owns and operates a wastewater treatment system which system comprises: an equalization pond (UT-T02), an aeration pond (UT-T06B), a storm water retention pond (UT-T05), a surge pond (UD-T02A), an emergency pond (UD-T02B), a PVC resin and ANDCO pond (UT-T13), and nine (9) sludge drying beds.

13. The wastewater treatment system function is designed to treat spent process water prior to discharge.

14. Respondent has not operated its facility without upset or accident during the tenure of its operation at its Point Comfort production facility, examples of such upsets and accidents being as follows:

a. On or about February 16, 1983, and March 9, 1983, during facility start-up operations, EDC decanters were upset at Respondent's facility and EDC was released into the storm water drain system which caused or allowed EDC to flow to the storm water retention pond and was subsequently pumped to Respondent's wastewater treatment system resulting in EDC levels in the storm water retention pond as high as 473 ppm on March 9, 1983.

b. On or about June 29, 1988, a plant upset caused pure EDC to be dumped into the wastewater treatment system and subsequently into the emergency pond resulting in EDC reaching levels as high as 10,022 ppm over an 8 day period.

c. On or about October 13, 1983, a valve was left open at the "distillation ends" (heavy ends) storage tanks, which tanks are numbered VT763A and VT763B.

15. Respondent had stored K019 and K020 waste on its site in tanks VT763A and VT763B which wastes flowed together through Respondent's storm drain system, through the storm water retention pond and into Respondent's equalization pond.

16. The discharge of K019 and K020 hazardous wastes into Respondents's equalization pond constitutes disposal as that term is defined at 42 U.S.C. §6903(3), RCRA §1004(3) 40 CFR 260.10.

17. At least 21 leaks occurred at Respondent's tank VT763A.

18. Respondent does not have a secondary containment or leak detection system at Formosa Point Comfort as required by 40 CFR 264.193 and 40 CFR 265.193.

19. The discharge of EDC and VCM heavy ends (sludge) for a plant producing ethylene dichloride and vinyl chloride monomer by the process described above in paragraph B.(1)-(9) consists of, inter alia, the following constituents: ethylene dichloride, trichloroethane, tetrachloroethane, and heavy chlorinated compounds (tars); as well as vinyl chloride, vinylidene chloride, trichloroethylene, tetrachloroethylene, chloroform, and carbon tetrachloride.

20. These sludges (discharge) were removed from Respondent's holding tanks and treated with a polymer for the purpose of stabilization.

21. As recently as March 1990, Respondent was pumping the mixed K019 and K020 waste (sludge) from tank VT763A to a mixing unit and treating it with a polymer for the purpose, also, of solidification for the purpose of transportation..

22. After the waste (sludge) was treated with polymer it went through a final treatment with lime at a 1:1 ratio, which was for the purpose of solidification.

23. The waste in tank #VT763A has been stored at Respondent's facility since December 1988, more than 15 months.

24. 40 CFR 262.34 provides that hazardous waste may not be stored on site for more than 90 days.

25. On September 22, 1989, a duly authorized inspector with the Texas Water Commission (TWC) conducted an inspection at Formosa Plastics Point Comfort facility. During this inspection a water sample (Sample A) was obtained from what was initially believed to be a leak detection system at the southeast corner of the storm water retention pond. However, subsequently the facility representative indicated that it was actually an unnumbered monitoring well. In addition, a sample (Sample B) was obtained from Monitor Well Number 5 (from a group of sixteen monitor wells installed in August, 1988) located south of the storm water retention pond. The analytical results for these two water samples are indicated below in units of "parts per billion (ppb)":

Parameter	Sample A	Sample B
Vinyl Chloride	20,000	250
Chloroethane	250	---
Methylene Chloride	---	60
Chloroform	90,000	17,000
1,1-Dichloroethylene	220	31
1,1-Dichloroethane	31,000	5,000
Trans-1,2-Dichloroethylene	5,000	660
Cis-1,2-Dichloroethylene	15,000	940
1,2-Dichloroethane (EDC)	350,000	1,100
Carbon Tetrachloride	990	---
Benzene	6,700	45
1,1,2-Trichloroethane	1,000	3,900
Trichloroethylene	18,000	1,800
Toluene	4	3
Tetrachloroethylene	260	470
Chlorobenzene	24	40

26. On December 8, 1989, a duly authorized inspector with TWC conducted an inspection at the facility. During the inspection a sample of liquid (Sample C) was collected from the

leak detection system at the surge pond (UD-T02A). The analytical results for this sample in units of ppb are indicated below:

Parameter	Sample C (ppb)
1,2-Dichloroethane (EDC)	700,000
Toluene Trichloroethylene ?	28,000

27. The contents of the storm water retention pond have leaked and are impacting the groundwater in the area. The contents of the surge pond have leaked into the surge pond's leak detection system and may have migrated further and could be impacting the groundwater in the area.

28. Area groundwater usage defined by well logs from the Texas Natural Resource Information System and from a domestic well survey conducted the week of May 7, 1990, indicate that usable groundwater is obtained primarily from aquifers located approximately seventy (70) feet or more in depth. The water is used for drinking, watering livestock and irrigation. The maximum depth at which contamination has been detected is approximately twenty (20) feet as indicated by the samples obtained by the TWC in September and December 1989. Additional sample data was sent to the TWC on August 15, 1990, confirming the previous TWC data and suggesting that the contamination is migrating vertically to the deeper zones. This would be expected since 1,2-Dichloroethane is denser than water.

29. The constituents identified in paragraphs 25 and 26 include several identified carcinogens, mutagens and tetratogens and may constitute a threat to human health by inhalation,

ingestion or absorption of the contaminated groundwater where concentrations exist above a maximum concentration level as established by the Safe Drinking Water Act, and may pose a threat to the environment.

VII. DETERMINATIONS

Based on the Findings of Fact and Conclusions of Law set forth above, the Director has made the following Determinations:

A. Respondent, Formosa Plastics, Corporation, Texas, is a facility as defined in 40 CFR 260.10.

B. Respondent is a person as defined at §1004(15) of the Resource Conservation and Recovery Act, 42 U.S.C. §6903(15); and is the owner/operator of the facility.

C. Respondent is a generator of hazardous waste.

D. There has been a release of hazardous waste and hazardous waste constituents into the environment from the facility which constitutes a potential threat of harm to human health and the environment.

E. Respondent owns and operates a treatment, storage and disposal (TSD) facility as defined under the terms of 40 CFR 264, 42 U.S.C. 6924 and 6925.

F. Respondent is a regulated RCRA facility.

G. The interim measures and comprehensive corrective actions ("actions") required by this Order are consistent with RCRA and are necessary to ascertain the nature and extent of the release at the

Facility, and are necessary to protect human health and the environment.

VIII. COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

DEEMED COMPLIANCE

Compliance with this Administrative Order subsequently approved pursuant to Section IX shall be deemed compliance with the regulations and statutory provisions applicable herein and during the pendancy of this Administrative Order, except for those matters not related to the subject of this Administrative Order.

IX. WORK TO BE PERFORMED

Based on the foregoing, it is hereby ORDERED AND AGREED that Respondent shall perform the following actions in the manner and by the dates specified below:

A. CORRECTIVE ACTIONS

Respondent shall undertake, continue to take, and complete each of the following actions to the satisfaction of EPA and in accordance with the terms, procedures and schedules which are set forth in Exhibit I - Corrective Action Plan ("CAP"). The CAP is hereby incorporated into this Order by reference as if reproduced in full herein.

1. ACCELERATED RCRA INVESTIGATION (ARFI)

No later than thirty (30) days after the effective date of this Order, Respondent shall submit to the Texas Water Commission (TWC) and EPA for review and EPA's approval a Draft Accelerated RCRA Facility Assessment Workplan (ARFI Workplan). The ARFI Workplan shall be prepared in accordance with the CAP. No

later than fourteen (14) days after receipt of EPA's approval of the Draft ARFI Workplan, Respondent shall submit a Final ARFI Workplan to the TWC and EPA for review and EPA's approval incorporating EPA's comments. Upon approval of the Final ARFI Workplan, Respondent shall undertake, or continue to take, the following ARFI tasks in accordance with the ARFI Workplan and concurrently with the Interim Measures in A.2. below:

a. Installation of Additional Wells;

b. Sampling of Monitor Wells;

c. Monitoring Wastewater Outfalls;

d. Soil Sampling;

e. Sludge/Solid/Liquid Phase Sampling; and

f. ARFI Report

2. INTERIM MEASURES ("IM")

Respondent shall undertake and complete the Interim Measures ("IM") in accordance with the CAP and in accordance with EPA guidance documents determined by EPA to be relevant.

3. RCRA FACILITY INVESTIGATION

Respondent shall undertake and complete the Facility Investigation program ("RFI") in accordance with the CAP and in accordance with EPA guidance documents determined by EPA to be relevant.

4. CORRECTIVE MEASURES STUDY

Respondent shall undertake and complete the Corrective Measure Study ("CMS") in accordance with the CAP and in

accordance with EPA guidance documents determined by EPA to be relevant.

5. CORRECTIVE MEASURES IMPLEMENTATION ("CMI")

Respondent shall undertake and complete the Corrective Measure Implementation ("CMI") in accordance with the CAP and in accordance with EPA guidance documents determined by EPA to be relevant.

6. ADDITIONAL WORK

The Director may determine that work, in addition to that detailed in the Workplans, including investigatory work and/or engineering evaluation, is necessary as part of the IM, RFI, and/or CMS. Subject to Section G (Dispute Resolution Clause) Respondent shall implement any additional IM, RFI, and/or CMS work which the Director determines to be necessary upon notification by the Director to the Respondent and according to the schedule set forth in such notification and shall complete such additional IM, RFI, and/or CMS work in accordance with the standards, specifications, and schedule determined or approved by the Director.

6. PROJECT COORDINATOR

a. On or before the effective date of this Order, EPA and Respondent shall each designate a Project Coordinator. Each Project Coordinator shall be responsible for overseeing the implementation of this Order. Unless provided otherwise, to the maximum extent possible, all communications between Respondent and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed

pursuant to the terms and conditions of this Order, shall be directed to and through the Project Coordinators. The EPA Project Coordinator has the authority to order the immediate cessation of any activity or condition that may, in his or her opinion, present an imminent and substantial endangerment to the public health, welfare or the environment.

b. The parties shall provide at least five days written notice prior to changing Project Coordinators. If either Project Coordinator shall be temporarily unavailable, an alternate or temporary Project Coordinator shall be named.

c. The absence of the EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

d. Any schedule changes agreed to by the Project Coordinators shall not be considered modifications of this Order. All agreed schedule changes must be in writing.

B. SAMPLING

The Respondent shall submit to the TWC and EPA the results of all sampling and tests or other data generated by its employees and/or consultants with respect to the implementation of this Order. Respondent shall submit these results in progress reports as described in the CAP and paragraph C of this Order. EPA will make available to the Respondent the results of sampling and/or tests or other data similarly generated by EPA.

Respondent will specify the name and address of the laboratory to be used for sample analysis. EPA reserves the right to conduct a performance and QA/QC audit of the above specified

laboratory before or during sample analysis. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis will be required.

At the request of EPA, the Respondent shall allow split or duplicate samples to be taken by EPA and/or its authorized representatives, of any samples collected by the Respondent pursuant to the implementation of this Order. The Respondent shall notify EPA, not less than fourteen (14) days in advance, of any well installation or sample collection activity.

C. REPORTING AND PUBLIC ACCESS TO DOCUMENTS

1. Respondent shall submit five copies of all reports, plans, specifications, schedules, notifications, and attachments required by this Order. Respondent shall submit four of said copies to EPA and one copy concurrently to the TWC. Any reports, plans, specifications, schedules and attachments required by this Order shall be incorporated into this Order upon written approval by EPA. Any noncompliance with such EPA approved plans, reports, specifications, schedules, and attachments shall be construed as a violation of the terms of this Order. Oral advice or approvals given by EPA and TWC representatives will not relieve Respondent of its obligation to obtain any formal, written approvals required by this Order.

2. <u>EPA/TWC Comment Coordination</u>.

EPA and TWC will make every effort to coordinate comments pursuant to an agreement between the agencies. In the

event that the agencies are unable to formalize such an agreement, Paragraph IX.L. shall apply.

3. Respondent may assert a claim of confidentiality for information submitted by Respondent or otherwise obtained by EPA concerning its production methods and processes if the information qualifies for exemption from the Freedom of Information Act, as provided by the exemption for trade secrets outlined in 5 U.S.C. §552(b)(4). Analytical data generated pursuant to the remedial investigation shall not be claimed as confidential. Confidentiality claims shall be submitted to EPA in accordance with the procedures outlined in 40 CFR Part 2, in particular, 40 CFR §2.203(b), and must include a written statement explaining how the information claimed to be confidential meets the substantive criteria for use in confidentiality determinations found in 40 CFR §2.208. If EPA approves the claim, the Agency will afford the information confidential status, as specified in Subpart B of 40 CFR Part 2. If Respondent makes no claim of confidentiality for information submitted pursuant to this Order, EPA will make the information available to the public without further notice to Respondent.

D. FACILITY ACCESS

EPA and/or any EPA authorized representative(s) are hereby authorized, allowed, and permitted to enter and freely move about all property at the Facility at all times (accompanied by a facility representative for safety reasons), that said Facility is operating and/or Respondent or its consultants are performing any

activities as mandated by this Order for the purposes of, inter alia: interviewing site personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of the Respondent in carrying out the terms of this Order; conducting such tests as EPA or its Project Coordinator deem necessary; using a camera , sound recording, or other documentary type equipment; and verifying the reports and data submitted to EPA by the Respondent. Regarding the use of a camera the following procedure will be followed; film exposed at the facility by EPA or its contractors shall be carried to a photo processing facility (a "1-hour processing facility" if available) in the joint custody of a representative of EPA and Formosa Plastics Corporation, Texas, the film shall be retrieved by a representative of EPA and the facility and then the facility representative may review the film and mark appropriate frames as "confidential business information," however all the negatives and prints remain the property of EPA at all times. The Respondent shall permit such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, in any way pertaining to work undertaken pursuant to this Order. To the extent areas adjacent to the Facility are presently owned by parties other than those bound by this Order, the Respondent has obtained or will use its best efforts to obtain site access agreements from the present owners within sixty (60) calendar days of the effective date of this Order. Best efforts as used in this paragraph shall include, at a minimum, a certified letter,

return receipt requested, from Respondent to the present owners of such property requesting access agreements to permit Respondent and EPA and its authorized representatives to access such property and payment of any access or easement fees. Such agreements shall provide to EPA or its authorized representatives equivalent access to the Facility. Any such access agreements shall be incorporated by reference into this Order. In the event that site access agreements are not obtained within sixty (60) days, the Respondent shall notify EPA regarding both the lack of, and efforts to obtain, such agreements. Nothing in this subsection is intended to limit, affect or otherwise constrain EPA's rights of access to property pursuant to applicable law.

E. RECORD PRESERVATION

1. Respondent shall preserve all official records and documents, i.e., reports and their supporting data, plans and correspondence prepared for or required by this Consent Order, which are received by Respondent, in Respondent's possession, or in the possession of its successors, agents, or contractors engaged pursuant to this Consent Order, regardless of any document retention policy to the contrary, for a minimum of five years from the creation of such documents.

2. Respondent shall notify EPA ninety (90) days prior to the destruction of any documents or records required to be kept under this Consent Order. Upon Request by EPA, Respondent shall make available to EPA, the actual records, or copies of the actual records required pursuant to this Consent Order.

F. FINANCIAL ASSURANCE

1. No later than thirty (30) days after the effective date of this Order, Respondent shall make the following demonstrations: Respondent shall present to EPA documents representing Respondent's commitment to completing the interim measures described in the Corrective Action Plan, in a timely manner, consistent with the Corrective Action Plan and other provisions of this Order. The documents to be submitted should include copies of pertinent labor and service contracts; purchase orders and capital expenditure letters of commitment; fiscal planning documents; summaries of these documents, together with supporting affidavits of Respondent's officials responsible for authorizing such contracts, purchase orders or capital expenditures, and whatever documents that Respondent might deem as appropriate to give assurance of its commitment to

complete the prescribed interim status measures in a timely and efficient manner. Any failure to comply with the provisions of this paragraph shall constitute a violation of this Order, and subject Respondent to liability for stipulated penalties and other enforcement action as detailed in this Order.

2. Within sixty (60) calendar days of the effective date of this Order, Respondent shall present to EPA for review and approval a summary and analysis of Respondent's existing instruments for financial assurance as provided under the financial assurance provisions of the TWC regulations corresponding to 40 CFR §§265.145, and/or any other instruments that have been provided previously by Respondent for any purpose related to liability coverage, closure, and post-closure care of its Facility. Respondent shall also provide a copy of each instrument for which a summary and analysis is being provided in accordance with this Section. The analysis shall describe clearly, but shall not be limited to, the following items:

a. The nature and extent to which these instruments are available for the purpose of ensuring the completion of all requirements established pursuant to this Order, including all Tasks described in the Attachments hereto; and

b. Precise dollar amounts that are available, and schedules for their availability, for the above-stated purposes. The amount of funds available through these instruments must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for the

financial assurance of closure, post-closure care, liability coverage, and the actions required under this Order.

3. EPA and TWC shall review the submittal described in paragraph 2 above and EPA shall provide notice to the Respondent as to the adequacy of its existing financial assurance measures for the above-stated purposes, and shall indicate therein what additional financial assurances, if any, must be provided by Respondent to ensure compliance with the terms of this Order.

4. Within thirty (30) days of Respondent's receipt of a notice from EPA that Respondent's financial assurance measures are inadequate, Respondent shall establish an irrevocable standby letter of credit or shall otherwise provide (per 40 CFR §265.142) additional financial assurances according to the terms provided in said notice. Such additional financial assurance measures shall be available to perform such terms or conditions established pursuant to the Order, provided that prior to drawing upon any such assurance measure, EPA shall notify the Respondent in writing of its alleged failure to perform the requirements of this Order and provide Respondent with a reasonable time period of not less than fifteen (15) calendar days within which to remedy the alleged non-performance.

5. This Order in no way negates Respondent's obligations to establish and/or maintain financial assurances for closure and postclosure care under 40 CFR §§265.143 and 265.145 and Chapter 31 TAC §335.112(7).

G. DISPUTE RESOLUTION

1. The parties shall use their best efforts to informally and in good faith resolve all disputes or differences of opinion. If, however, disputes arise concerning this Order including, but not limited to, implementation of the Workplans, approval of documents, scheduling of any of the work, selection, performance or completion of any corrective action, or any other obligation assumed hereunder, which the parties are unable to resolve informally, the Respondent shall present a written notice of such dispute and the basis for the objections within 5 days of the receipt of EPA'S disapproval, decision, or directive. Said notice shall set forth the specific points of the dispute, Respondent's position and the documents in support thereof. Within twenty-one (21) days of EPA's receipt of such written notice, the EPA shall provide to Respondent its final decision on the pending dispute which shall be binding upon both parties to this Order, unless Respondent requests an opportunity for a conference in accordance with paragraph 2 of this Section.

2. Except as provided in Paragraph IX.G.5, below, if Respondent objects to any EPA determination as set forth in Paragraph 1 above, regarding any requirement by EPA then Respondent shall, within ten (10) days of its receipt of EPA's decision pursuant to paragraph 1 of this Section, notify EPA in writing of its objections and may request the Director to convene an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. After this conference,

the Director shall state, in writing, his decision regarding the issues in dispute. Such decision shall be the final resolution of the dispute and shall be implemented immediately by Respondent.

3. The existence of a dispute as defined herein, and EPA's consideration of disputed matters shall not excuse, toll or suspend any compliance obligation or deadline during the pendency of the dispute resolution process.

4. Stipulated penalties shall continue to accrue during the pendency of any dispute resolution proceedings, however, the obligation to pay stipulated penalties shall be stayed until the Director states his decision. If Respondent is successful there shall be no obligation to pay stipulated penalties. If the Respondent is unsuccessful and EPA's original decision is upheld, Respondent shall pay stipulated penalties in accordance with paragraph IX.K, Stipulated Penalties.

5. If Respondent objects to an EPA determination requiring that Respondent perform work in addition to the work provided for in this Order, Respondent shall have 30 days from receipt of EPA's determination to notify EPA in writing of its objections and may request the Director to convene an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. After this conference, the Director shall state, in writing, his decision regarding the issues in dispute.

Such decision shall be implemented immediately by Respondent. Stipulated penalties shall not begin to accrue for

work in addition to the work provided for in this Order until the Director provides his decision.

H. REIMBURSEMENT OF OVERSIGHT COSTS

Oversight costs are those costs incurred by the United States for EPA salary, travel, equipment, analysis, and contractor costs related to the facility. Respondent agrees to pay EPA for oversight costs associated with the implementation and execution of this Order, unless otherwise prohibited by law, in the following manner:

1. At the end of each six (6) month period beginning from the effective date of this Order, EPA will submit to Respondent a tabulation and an explanation of all oversight costs incurred with respect to this Order by EPA during the previous six (6) month period.

2. Payments to EPA for all EPA oversight costs, up to a maximum of $60,000 per six (6) month period, shall be made by Respondent by certified or cashier's check in accordance with the directives submitted with each tabulation discussed above in H.1.

I. RESERVATION OF RIGHTS

EPA hereby reserves all of its statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including, without limitation, the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C

6928(h)(2). This Order shall not be construed as a waiver or limitation of any rights, remedies, powers and/or authorities which EPA has under RCRA, CERCLA 42 U.S.C. §9601 et. seq., or any other statutory, regulatory or common law enforcement authority of the United States.

This Order shall not be construed to affect or limit the rights or responsibilities of any Federal, State, or local agency or authority pursuant to any other statutory provision, nor shall the entry of this Order and Respondent's consent to comply herewith, limit or otherwise preclude the EPA from taking additional enforcement action pursuant to RCRA Sections 3008(h) or 7003 or CERCLA 42 U.S.C. §9601 et. seq., should the EPA determine that such actions are warranted. Further, this Order shall not be construed to affect or limit, in any way, the obligation of the Respondent to comply with all Federal, State and local laws, orders and regulations governing the activities required by this Order. This Order shall not be construed as a ruling or determination of any issue related to any Federal, State or local permit whether required in order to implement this Order or required in order to continue or alter operations of the Facility (including but not limited to construction, operation or post-closure permits required under RCRA) and the Respondent shall remain subject to all such permitting requirements. Nothing in this Order is intended to release or waive any claim, cause of action, demand or defense in law or equity that any party to this Agreement may have against any person(s) or entity not a party to this Agreement.

Notwithstanding any other provision of this Order, the Respondent shall remain responsible for obtaining any Federal, State, or local permit for any activity at the Facility including those necessary for the performance of the work and for the operation or closure of the Facility.

J. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION OF THE ORDER

1. The effective date of this Order shall be the date on which the Director signs the Order.

2. Except as expressly provided herein, this Order may only be amended by mutual agreement of EPA and the Respondent. Any such amendments shall be in writing, shall be first signed by the Respondent, and shall be effective and incorporated into the Order on the date that such amendments are signed by the Director.

3. Any reports, plans, specifications, schedules, and attachments required by this Order are, upon written approval by EPA, incorporated into this Order.

K. STIPULATED PENALTIES

1. Unless there has been a written modification of a compliance date by EPA, or the force majeure provisions of this Order are applicable, in the event Respondent fails to meet any requirement set forth in this Order, Respondent agrees to pay a Stipulated Penalty as follows:

Period of Non-Compliance	Stipulated Penalty Per Non-Compliance Per Day
1st through 14th day	$ 1,500.00
15th through 44th day	$ 5,000.00
45th day and beyond	$10,000.00

2. Stipulated penalties under this Section shall be paid within ten (10) calendar days after Respondent's receipt of written demand by EPA. Such stipulated penalties shall be paid by certified or cashier's check made payable to "Treasurer of the United States" and mailed to Regional Hearing Clerk, EPA, Region VI, P.O. Box 360582M, Pittsburgh, PA, 15251. The check shall reference the complete and correct address of the Respondent, the Order name and docket number, and shall be due and payable by the 15th day of the month following the month in which EPA imposes such penalties. A copy of the check and letter forwarding the check shall be submitted to the EPA Project Coordinator.

3. The stipulated penalties set forth above shall be in addition to and shall not exclude any other remedies or sanctions available to the United States.

L. EPA APPROVALS/DISAPPROVALS

All decisions, determinations and approvals required to be made by EPA under this Order must be in writing signed by the Chief of the Texas Section, RCRA Enforcement Branch ("Chief"). If the Chief does not approve any plan, report or other item required to be submitted to EPA for its approval pursuant to this Order, the Respondent shall correct any deficiencies as directed by the Chief

and resubmit the plan, report or other item for the Chief's approval within the time period specified in this Order. Whenever in this Order approval is required expressly or implicitly by both EPA and TWC, approval from EPA only shall suffice for purposes of securing approvals required under this Order.

M. PARTICIPATION IN COMMUNITY RELATIONS ACTIVITIES

Respondent shall be given notice of and shall participate in public meetings, as appropriate, which may be held or sponsored by EPA to explain activities at, or concerning, the Facility, including the findings of the RFI and CMS. In addition, Respondent shall provide all support reasonably requested of them by EPA in carrying out the EPA approved Community Relations Plan.

N. TERMINATION AND SATISFACTION

The provisions of this Order shall be deemed satisfied upon receipt by the Respondent of written notice from EPA that the Respondent has demonstrated that all of the terms of this Order, including any additional work which EPA may determine to be necessary pursuant to Section IX.A.6. of this Order, and any interim remedial measures which EPA may select have been completed to the satisfaction of EPA, but not including the record preservation provision of paragraph IX.E., or other such continuing requirements. Upon such demonstration by the Respondent, said written notice shall not be unreasonably withheld or delayed.

O. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

Respondent agrees to indemnify and save and hold harmless the United States Government, its agencies, departments, agents, and employees, from any and all claims or causes of action arising from or on account of acts or omissions of Respondent or its agents, independent contractors, receivers, trustees, and assigns in carrying out activities required by this Order. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of Respondent or the United States under their various contracts.

P. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, Respondent shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved plans.

In addition, Respondent shall:

1. Follow all EPA guidance for sampling and analysis determined by EPA to be applicable;

2. Consult with EPA in planning for, and prior to, field sampling and laboratory analysis;

3. Inform the EPA Project Coordinator in advance which laboratories will be used by Respondent and ensure that EPA personnel and EPA-authorized representatives have reasonable access to the laboratories and personnel used for analysis;

4. Ensure that laboratories used by Respondent for analyses perform such analyses according to EPA methods (SW-846) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Respondent shall submit all protocols to be used for analyses to EPA for approval within sixty (60) days prior to the commencement of analyses; and

5. Ensure that laboratories used by Respondent for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis of a reasonable number of known samples provided by EPA to demonstrate the quality of the analytical data.

Q. FORCE MAJEURE

1. Respondent shall perform the requirements under this Order within the time limits set forth or approved or established herein, unless the performance is prevented or delayed solely by events which constitute a force majeure. A force majeure is defined as any event arising from causes not reasonably foreseeable and beyond the control of Respondent, including its consultants and contractors, which could not be overcome or mitigated by due diligence and which delays or prevents performance by a date required by this Order. Such events do not include unanticipated or increased costs of performance, changed economic circumstances, or normal precipitation events. Other examples of events that are not force majeure events include, but are not limited to, the

technical infeasibility of meeting current or existing future requirements; the financial difficulty of the Respondent to perform the work; acts or omissions not otherwise force majeure attributable to Respondents contractors or representatives; or the failure of Respondent or Respondent's contractors or representatives to make complete and timely application for any required approval or permit.

2. Respondent must notify EPA in writing by no later than two weeks after the occurrence of events which it knows constitute a force majeure. Such notice shall estimate the anticipated length of delay, including necessary demobilization and remobilization, its cause, measures taken or to be taken to minimize the delay, and an estimated timetable for implementation of those measures. Respondent shall adopt all reasonable measures to avoid and minimize delay. Failure to comply with the notice provision of this Section shall be deemed a waiver of the claim by Respondent and grounds for EPA to deny Respondent an extension of time for performance.

3. If EPA determines that the delay has been or will be caused entirely by circumstances not reasonably foreseeable and beyond Respondent's control, including its consultants and contractors, which could not have been overcome by due diligence, the time for performance of that element of the Workplan shall be extended for a period equal to the delay resulting from such circumstances. Such an extension will alter, for a commensurate period, the schedule for the performance or completion of other tasks required by the Workplan which are dependent upon completion of the element of the Workplan which has been delayed. However, such an extension does

not alter the schedule for performance or completion of other tasks required by the Workplan unless these are also specifically altered by amendment of the Order or underlying plan. In the event that EPA and Respondent cannot agree that any delay or failure has been or will be caused entirely by circumstances not reasonably foreseeable and beyond the control of Respondent, which could not have been overcome by due diligence, or if there is not agreement on the length of the extension, the dispute shall be resolved in accordance with the Dispute Resolution provisions of this Order.

R. NOTIFICATIONS OF PARTIES

Whenever, under the terms of this Order, a plan, report, notice, approval, certification, or other document is required to be submitted by one party to another, such document shall be sent by the person(s) specified in accordance with Section IX.A.7.a., and shall be sent to the person(s) specified in accordance with Section IX.A.7.a., unless any such person or any such person's successor gives notice in writing to the other party or another person designated to send or to receive such documents or of another address, or unless it is otherwise specifically provided in this Order.

S. NO FINAL AGENCY ACTION

Notwithstanding any other provisions of this Order, no action or decision by EPA, including without limitation, decisions of the Director or the Regional Administrator, pursuant to this Order

shall constitute final agency action giving rise to any rights to judicial review prior to EPA's initiation of judicial action to compel Respondent's compliance with the mandate(s) of this Order.

X. PENALTY PROVISIONS

Failure or refusal to carry out the terms of this Order in a manner deemed satisfactory to EPA subjects Respondent to a civil penalty in an amount not to exceed $25,000 for each day of non-compliance with this Order in accordance with Section 3008(h) of RCRA, 42 U.S.C. §6928(h).

XI. STATEMENT OF SEVERABILITY

All provisions of this Order are intended to stand independently. The nullification of any one provision, either by judicial decree or agreement of the parties will not affect the validity or effectiveness of the remaining provisions.

IT IS SO AGREED AND ORDERED.

Dated: 2/27/91

Allyn M. Davis, Director
Hazardous Waste Management Division
U.S. Environmental Protection Agency
Region 6

Dated: 2-25-91 BY:

Formosa Plastics Corporation, Texas

NAME (PLEASE PRINT): RONDOLL P. SMITH

TITLE (PLEASE PRINT):

Plant Manager
Formosa Plastics Corporation, Texas

Dated: 2-25-91 BY: Alden L. Andre

Formosa Plastics Corporation, ~~Texas~~ USA

NAME (PLEASE PRINT): ALDEN L. ANDRE

TITLE (PLEASE PRINT):

Corporate Vice President
Operations/Environment
Formosa Plastics Corporation, USA

CERTIFICATE OF SERVICE

I hereby certify that the original of the foregoing Administrative Order RCRA Docket No. VI-001(h)-90-H was filed with the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6 and that a true and correct copy of the same was placed in the United States mail, postage prepaid, certified mail, return receipt requested, on this 27 day of February 1991, addressed as follows:

C.T. Corporation System
Registered Agent for Service for
Formosa Plastics Corporation, Texas
350 N. St. Paul
Dallas, Texas 75201

Mr. Randy Smith
Plant Manager
Formosa Plastics Corporation, Texas
P.O. Box 400
Point Comfort, Texas 77978

Lauretta Scott
Lauretta Scott

AMENDMENT NO. 1

IX. WORK TO BE PERFORMED

L. EPA APPROVALS/DISAPPROVALS

All decisions, determinations and approvals required to be made by EPA under this Order must be in writing signed by the Project Coordinator. If the Project Coordinator does not approve any plan, report or other item required to be submitted to EPA for its approval pursuant to this Order, the Respondent shall correct any deficiencies as directed by the Project Coordinator and resubmit the plan, report or other item for the Project Coordinator's approval within the time period specified in this Order. Whenever in this Order approval is required expressly or implicitly by both EPA and TWC, approval from EPA only shall suffice for purposes of securing approvals required under this Order.

IT IS SO AGREED AND ORDERED:

Dated: 2-14-94 By: W Kew Mowngw
Formosa Plastics Corporation

Dated: 3/3/94 By: Allyn M Davis
Allyn M. Davis, Director
Hazardous Waste Management Division
U.S. Environmental Protection Agency

FORMOSA CAP

I

SCOPE OF WORK FOR ACCELERATED
RCRA FACILITY INVESTIGATION (ARFI)
AT
FORMOSA PLASTICS CORPORATION, POINT COMFORT, TEXAS

The Respondent shall submit to EPA and TWC for review and EPA approval an Accelerated RCRA Facility Investigation Workplan (ARFI Workplan) to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the facility, to confirm or deny the presence of hazardous waste or hazardous waste constituents at or near the boundaries of the active, closing, or inactive units, and to complement the present groundwater monitoring system. The ARFI Workplan shall include and be supported by an engineering analysis and quality assurance/ quality control plan that addresses the tasks listed below:

Task I: Installation of Additional Wells

Task II: Sampling of Monitoring Wells

Task III: Wastewater Outfall Monitoring

Task IV: Soil Sampling

Task V: Sludge/Solid/Liquid Sampling

Task VI: Reports

TASK I: INSTALLATION OF ADDITIONAL WELLS

Respondent shall in effect create monitoring well clusters at each of the current shallow aquifer monitor wells P-20, P-21, P-24, and one well in the vicinity of P-4 and P-14; by drilling a well into the deep aquifer at location adjacent to each shallow aquifer well. Under this task wells shall be installed to study the effect if any of the following units: storm water retention pond, aeration pond, emergency pond, equalization pond and neutralization pond.

For those shallow well locations at which wells are not installed in the deeper aquifer, the Respondent shall provide sufficient evidence to EPA that the deep wells are not justified at those particular locations. Upon approval by EPA the particular well(s) will be struck from further requirements.

The well installed under this ARFI in this and following sections shall be constructed using flush-joint, internal upset, threaded (or an equivalent method of joining couplings without rivets, screws or glues) casing manufactured from inert materials. The bore hole for casings and screens shall be a minimum of six (6) inches greater in diameter than the well casing or screen nominal diameter. Filter pack and screen slot openings shall be sized based on formation size and characteristics. Well screen lengths shall be no more than ten (10) feet in length. The respondent may request a modification in the specified well screen length if the modification is required by conditions encountered in the field. After review EPA will allow or deny the modification. The filter pack shall extend no more than two (2) feet above the top of the screen and shall not cross any clay layers which may act as aquitards. If a bentonite seal is used, the bentonite shall be allowed to hydrate a minimum of twelve (12) hours before placement of grout. The respondent may request a modification in the hydration time if warranted by geologic conditions. After review EPA will allow or deny the modification. Grout shall be pressure circulated to the surface and allowed to set a minimum of twelve (12) hours before initiating development.

Development procedures shall include purging of the well until contaminants introduced during drilling can be assured as being removed. Development shall also include surging with a surge plug, and either bailing or pumping until the nephelometric turbidity units (N.T.U.) can be consistently measured at five (5.0) or less. If turbidity in groundwater samples is attributed to natural hydrogeologic conditions peculiar to the screened zone, and a water clarity of five (5) units is not achievable, the Respondent must demonstrate to the satisfaction of the EPA that turbidity of the water samples will not compromise the validity of the analyses. Well head construction shall include a well pad keyed into the well annulus and a system to secure the well from traffic and unauthorized access. Within forty-five (45) days of construction and development of the last well required under this section, the

Respondent shall submit to the EPA and TWC a report including:

1) surveyed location of each well;

2) surveyed ground level, top of casing and top of well pad referenced to a known elevation datum (NGVD, 1929);

3) static water level, referenced to mean sea level;

4) well construction data (including a diagram for each well) detailing total depth, screen placement, gravel pack, annular seal, bore hole and casing size (all measured to within .25 foot), and well log; and

5) well development data.

TASK II: SAMPLING OF MONITORING WELLS

Respondent shall sample all of the wells developed under Task I and the following existing wells: D-2, D-3, P-3, P-4, P-8, P-10, P-11, P-12, P-13, P-14, P-19, P-20, P-21, P-22, P-23, and P-24.

The initial sample analyses shall be obtained for 40 CFR Part 264 Appendix IX constituents and dissolved metals. Following the initial sampling event the existing monitor wells listed above and newly constructed wells will be sampled every seven (7) days for a period of twenty-one (21) days, these samples will be analyzed for parameters selected by the respondent, using the chemicals known to be on site as a basis for selection. However if the initial Appendix IX analysis shows the presence of a constituent not analyzed for in the subsequent three samples, those wells will be resampled and will be analyzed for the Appendix IX constituents.
Respondent shall have an approved Quality Assurance / Quality Control program to ensure analytical validity. Dedicated bladder-type pumps shall be allowed for evacuation and sampling procedures involving all monitoring wells.

This sampling and analysis effort shall be initiated within fourteen (14) days after monitor well construction in Task 1 begins. The results of the sampling shall be reported to EPA and TWC in the ARFI Report required under Task VI of this section.
All sampling events will include collection of a water sample and a sample of any Dense Non-Aqueous Phase Liquid Layer (DNAPL) and a Light Non-Aqueous Phase Liquid Layer (LNAPL) if present. The DNAPL and LNAPL samples will be collected prior to purging the well. The water sample will be collected after the well is correctly evacuated.

TASK III: WASTEWATER OUTFALL MONITORING

Respondent shall submit the analysis conducted by Texas A&M University within the ARFI Work Plan. EPA will review the report and assess its adequacy to determine whether hazardous waste is leaving the facility through the surface water.

If the Texas A&M Report is determined to be insufficient by EPA the Respondent shall collect composite water samples at each NPDES sampling point at the Facility in accordance with Respondent's current procedures for NPDES monitoring.

Respondent shall also collect sediment samples at each NPDES sampling point at the Facility. If the discharge channel at the collection point is of man-made material the closest down gradient point at which natural material is available as sediment sample material should be chosen for the sediment samples. The sediment samples at each NPDES outfall shall consist of the following set of samples:

1) a surface sediment sample in the center of the channel;
2) a subsurface composite sediment sample between the depth 6"-12", in the center of the channel;
3) a surface sediment sample 90% of the distance from the center of the channel to the bank; and
4) a subsurface composite sediment sample between the depth 6"-12", 90% of the distance from the center of the channel to the bank.
5) Background sample from an area near the facility unaffected by NPDES discharges.

40 CFR Part 264 Appendix IX analysis of the samples shall be performed. This sampling and analysis effort shall be performed twice over a period of thirty (30) days. EPA will review the Texas A&M Report within 30 days of the issuance of this order. The time period for this task will be initiated immediately after EPA disapproval of the Texas A&M Report. The results of the sampling shall be reported to EPA and TWC in the ARFI Report required under Task VI of this section. After the completion of the two sampling events, the Respondent may identify and propose to EPA a subset of parameters for each of the three outfalls sampling locations to replace the Appendix IX parameter list. Upon EPA approval, the Respondent may use the revised sample parameter list(s), and report the results to EPA and TWC on a quarterly basis. EPA reserves the right to subsequently expand the parameter list(s).

TASK IV: SOIL SAMPLES

1) Soil samples shall be collected in the range 0-1 feet beneath the concrete pad that underlies tanks VT763A and VT763B. Five (5) samples in all should be collected in locations adjacent to visible cracks in the concrete and the samples should be evenly distributed over the area of the pad, allowing for obstruction of the tanks themselves and the associated piping. The sample holes should be appropriately filled after sampling to prevent the creation of a conduit for future contamination to pass to the soil below. Samples will be collected within thirty (30) days of EPA approval of the final ARFI work plan and will be analyzed for constituents known to be present in the tanks. Respondent will provide a list of constituents to the EPA in the ARFI Work Plan.

TASK V: SLUDGE/SOLID/LIQUID PHASE SAMPLES

Starting seven (7) days after EPA approval of the Final ARFI workplan, for each pond/impoundment/basin onsite, a sample of each liquid phase present will be collected every seven (7) days for a period of twenty-eight (28) days. In addition, a sample of the sludge/solid phase will be collected at the time of the first and fourth liquid phase sample. The initial liquid and sludge/solid samples from each pond/impoundment/basin will be collected and analyzed for Appendix IX constituents. The subsequent samples may be analyzed for those constituents the respondent certifies as known to be present in the respective pond/impoundment/basin. However if the initial Appendix IX analysis indicates the presence of a constituent not analyzed for in the subsequent samples, those samples will recollected and reanalyzed for the Appendix IX constituents.

Starting seven (7) days after EPA approval of the Final ARFI workplan a sample of sludge/solid and a sample of each liquid phase present will be collected every seven (7) days for a period of twenty-eight days from tanks VT763A and VT763B and any other tank/container used for storage of K019 and K020. All samples will be analyzed for the hazardous waste constituents known to be present in K019 and K020.

>200 ppm high.
20 - 200 ppm medium
0 - 20 low

TASK VI: ACCELERATED RCRA FACILITY ASSESSMENT REPORT

1. Task I, II, III, IV and V Report

Within one hundred and fifty (150) days of EPA approval of the Final ARFI workplan, Respondent shall submit a report detailing Task I, Task II, Task III, Task IV and Task V efforts for EPA review and approval. This report shall also make recommendations for further measures necessary and guide the development of the RFI Workplan. Within thirty (30) days of EPA approval of the report, the Respondent shall finalize the report.

Facility Submission Summary

A summary of the information reporting requirements contained in the Interim Measure Scope of Work is presented below:

Facility Submission	Due Date
Draft ARFI Workplan	30 days from effective date of this Order
Final ARFI Workplan	14 days from EPA comments on Draft ARFI Workplan
ARFI Task I	To complete within 28 days after EPA approval of the Final ARFI Workplan
Well I installation Report	45 days after development of the last well and an update report within 30 days of the construction of additional wells, if any
ARFI Task II	After new wells identified in the ARFI Work Plan are constructed, sampling of the new and existing wells will be initiated. The initial sampling will start within 14 days after monitor well construction begins. The sampling will be completed 42 days after EPA approval of the Final ARFI Work Plan
ARFI Task III	EPA will approve/not approve the Texas A&M Report within 30 days of the issuance of the order. To end within 60 days of EPA approval of the Final ARFI workplan
ARFI Task IV	Samples collected within 30 days after EPA approval of the Final ARFI workplan
ARFI Task V	End within 60 days from the EPA approval of the Final ARFI workplan
ARFI Task VI	Within 150 days of EPA approval of the Final ARFI workplan.

II

SCOPE OF WORK FOR INTERIM MEASURES (IM)
AT
FORMOSA PLASTICS CORPORATION
POINT COMFORT, TEXAS

PURPOSE

The purpose of Interim Measures (IM) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Formosa Plastics Corporation. Upon review and approval of the proposed IM Work Plan by EPA, Respondent will furnish the personnel, materials, and services necessary to implement the IM, except as otherwise specified.

SCOPE

The Interim Measures consist of six tasks:

Task I: Identification and Development of the Interim Measure Alternative or Alternatives

A. Description of Current Situation
B. Establishment of Corrective Action Objectives
C. Screening of Corrective Measures Technologies
D. Identification of the Corrective Measure Alternative or Alternatives

Task II: Evaluation of the Interim Measure Alternative(s)

A. Technical/Environmental/Human Health/Institutional
B. Cost Estimates

Task III: Justification and Recommendation of the Interim Measures

A. Technical
B. Environmental
C. Human Health
D. Institutional

Task IV: Proposed Work Plan

Task V: Corrective Measure Construction

A. Responsibility and Authority
B. Construction Quality Assurance Personnel Qualifications
C. Inspection Activities

D. Sampling Requirements
E. Documentation

Task VI: Reports

A. Progress
B. Draft
C. Final

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE INTERIM MEASURES ALTERNATIVES

Based on the results of the Accelerated RCRA Facility Investigation (ARFI) the Respondent shall identify, screen, and develop the alternative(s) for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Respondent shall make a facility-specific statement of the purpose for the response, based on the results of the ARFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent, in conjunction with EPA, shall establish site specific objectives for the interim action. These objectives shall be based on public health and environment criteria, information gathered during the ARFI, EPA guidance and the requirements of any applicable Federal statutes and existing information on ground water contamination at the site. At a minimum, all corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR §264.100.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the ARFI and assess all potential technologies which are applicable to the facility, which will achieve the corrective measure, objective(s) within a reasonable time period.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies.

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process.

3. Technology Limitations

The level of technology development, performance record, and inherent construction, operation and maintenance problems shall be identified for each technology considered.

D. Identification of the Corrective Measure Alternatives

The Respondent shall develop the IM alternatives based on the corrective measure objectives and the current situation at the facility. The alternatives developed shall include, but are not limited to, source removal, impoundment closure, pump and treat remediation, and enhanced bioremediation.

TASK II: EVALUATION OF THE INTERIM MEASURE ALTERNATIVE OR ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passed the Initial Screening in Task I and evaluate each corrective measure alternative and it's components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Respondent shall also develop cost estimates for each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the four following areas:

1. Technical

a. The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained.

b. The Respondent shall provide information on the reliability of each corrective measure including their operation and maintenance requirements, and their demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions.

c. The Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time

required to achieve a given level of response:

i) Constructability is determined by conditions both internal and external to the facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility; and

ii) Time has two components that shall be addressed: 1) the time it takes to implement a corrective measure and 2) the time it takes to actually see beneficial results.

d. The Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation.

2. Environmental

The Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative.

3. Human Health

The Respondent shall assess each alternative in terms of the extent which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure.

4. Institutional

The Respondent shall assess the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE INTERIM MEASURES

The Respondent shall justify and recommend an IM alternative using technical, human health, and environmental criteria. EPA will select the corrective measure(s) alternative or alternatives to be implemented based on the results of Tasks II and III. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures are most effective at performing their intended function and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and have proven effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) on the environment over the shortest period of time will be favored.

TASK IV: WORK PLAN

The Respondent shall prepare a Corrective Measure Study Report presenting the results of Task I through III recommending IM alternative.

A. Progress

The Respondent shall at a minimum provide EPA with a progress report signed by the plant manager, forty-five (45) days after approval of the Final ARFI Work Plan:

1. A description and estimate of the percentage of the IM completed;

2. Summaries of all findings;

3. Summaries of all changes made in the IM during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period.

5. Summaries of all problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel associated with corrective measures and plant management during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

The Report shall be submitted one hundred and twenty (120) days after approval of the Final ARFI Work Plan,shall at a minimum include:

This is prior to submission of ARFI Report 150 days after approval of ARFI Work plan.

1. A summary of the corrective measure or measures and rationale

   a. Description of the corrective measure or measures and rational for selection;

   b. Performance expectation;

   c. Preliminary design criteria and rationale;

d. General operation and maintenance requirements;

e. Long-term monitoring requirements

2. Design and Implementation Precautions:

a. Special technical problems;

b. Additional engineering data required;

c. Permits and regulatory requirements;

d. Access, easements, right-of-way;

e. Health and safety requirements; and

f. Community relations activities.

C. Final

The Respondent shall finalize the IM Work Plan incorporating comments received from EPA on the Draft Corrective Measure Study Report. The Final IM Work Plan shall be submitted fourteen (14) days after EPA approval of the Draft IM Work Plan.

TASK V: INTERIM MEASURE CONSTRUCTION

Subject to EPA approval, Respondent may install those Interim Measure(s) that Respondent deems appropriate to control Ground Water Contamination at the facility, such as a "pump and Treat" recovery system. Respondent will submit such a plan to EPA for review at least 45 days prior to the start of work. Any Interim Measure installed prior to EPA approval is subject to alteration and modification in accordance with the approved Interim Measure Plan. Following EPA approval of the final design, Formosa Plastics Corporation shall develop and implement a construction quality assurance (CQA) program to ensure, with a reasonable degree of certainty, that a completed interim measure(s) meets or exceeds all design criteria, plans and specifications. The CQA plan is a facility specific document which must be submitted to the Agency for approval prior to the start of construction.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure shall be described fully in the CQA plan. Formosa Plastics Corporation must identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA plan. In addition to oversight inspections, Formosa Plastics Corporation shall conduct the following activities:

1. Preconstruction inspection and meeting with EPA to:

   a. Review methods for documenting and reporting inspection data;

   b. Review methods for distributing and storing documents and reports;

   c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion Formosa Plastics Corporation shall notify EPA for the purpose of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. Formosa Plastics Corporation will certify that the treatment equipment has performed to meet the purpose and intent of the specifications. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final Inspection

For the purpose of conducting a final inspection which will consist of a walk-through inspection of the project site, Formosa Plastics shall notify EPA upon the completion of any outstanding construction. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made by EPA that outstanding items have been resolved.

D. <u>Sampling Requirements</u>

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This shall include items such as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK VI: REPORTS

Formosa Plastics Corporation shall prepare plans, specifications, and reports as set forth in Task I through Task V to document the design, construction, operation, maintenance and monitoring of the corrective measure. The documentation shall include, but not be limited to the following:

A. Progress

The Respondent shall at a minimum provide the EPA with monthly progress reports signed by the plant manager, beginning with the effective date of the order, containing:

1. A description and estimate of the percentage of the IM completed;

2. Summaries of all findings and data, collected during the reporting period;

3. Summaries of all changes made in the IM during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel associated with corrective measures and plant management during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

1. Formosa Plastics Corporation shall submit a draft Construction Quality Assurance Program Plan and Documentation as outlined in Task V; and

2. At the "completion" of the construction of the project, Formosa Plastics Corporation shall submit a Corrective Measure(s) Implementation Report to the Agency. The Report shall document that the project

is consistent with the design specifications, and that the corrective measure is performing adequately. The Report shall include, but shall not be limited to the following elements:

a. Synopsis of the corrective measure and certification of the design and construction;

b. Explanation of any modifications to the plans and why these were necessary for the project;

c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also for explaining any modifications to these criteria;

d. Results of facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria; and

e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

C. Final

Formosa Plastics Corporation shall finalize the Interim Measure Implementation Program Plan, Construction Plans and Specifications, Design, Reports, Operation and Maintenance Plan, Project Schedule Study Reports, Construction QA Program Plan/Documentation, Additional Studies Report and the Corrective Measure Implementation Report incorporating comments received on draft submissions.

Submission Summary

A summary of the information reporting requirements contained in the Interim Measure Implementation Scope of Work is present below:

Facility Submission	Due Date
IM Task I	45 days after EPA approval of Draft ARFI Work Plan
IM Task II and III	45 days after EPA approval of Final ARFI Work Plan
IM Progress Report	45 days after EPA approval of the Final ARFI Work Plan
Draft IM Work Plan	120 days after EPA ~~Task VI~~ approval of the Final ARFI Work Plan
Final IM Work Plan Task IV	14 days after EPA approval of Draft IM Work Plan
IM Task V	Begin immediately after EPA approval of Final IM Work Plan.
IM Task VI	Upon completion of construction phase
Progress Reports	Every Month *

* Dates are calculated from the effective date of this Order.

III

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI) AT FORMOSA PLASTICS CORPORATION POINT COMFORT, TEXAS

PURPOSE

The purpose of this RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. In order to define the scope of the RFI Workplan, the Description of Current Conditions (Task I), shall include under The Nature and Extent of Contamination Section (Task I.B.), summary and assessment of the investigative and remedial efforts conducted at the Facility to date. This summary shall follow the format of the Facility Investigation (Task III), incorporating the appropriate portions of the RFI Workplan requirements. The RFI Workplan proposed for further investigation under Task III shall then address those portions of the investigation not adequately defined by the Task I report, as determined by EPA. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI at Formosa.

SCOPE

The RCRA Facility Investigation consists of six tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: RFI Workplan

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task III: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization

D. Potential Receptor Identification

Task IV: Investigative Analysis

A. Data Analysis
B. Protection Standards

Task V: Laboratory and Bench-Scale Studies

Task VI: Reports

A. Preliminary and Workplan
B. Progress
C. Draft and Final

TASK I: PRELIMINARY REPORT: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit to EPA and TWC a Preliminary Report providing the background information pertinent to the facility, contamination and any type of on-going corrective action as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. Facility Background

The Respondent report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:

   a. General geographic location;

   b. Property lines, with the owners of all adjacent property clearly indicated;

   c. Topography (with a contour interval sufficient in detail to indicate surface water flow and drainage and a scale of 1 inch - 200 feet), waterways, all wetlands, floodplains, water features, drainage patterns;

   d. All solid waste management units storage or disposal areas active after November 19, 1980;

   e. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;

   f. All known past and present product and waste underground tanks or piping;

   g. Surrounding land uses (residential, commercial, agricultural, recreational); and

   h. The location of all production and groundwater monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations included (these elevations may be included as an attachment).

All maps shall be consistent with the requirements

set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses.

B. Nature and Extent of Contamination

The Respondent shall include in the Preliminary Report the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);

   b. Quantities of solid and hazardous wastes;

   c. Hazardous waste or constituents, to the extent known; and

   d. Identification of areas where additional information is necessary.

2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

   a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;

   b. All potential migration pathways including

information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

c. The potential impact(s) on human health and the environment, including demography, groundwater and surface-water use, and land use.

C. Implementation of Interim Measures

The Respondent's report shall document interim measures which were or are being undertaken at the facility other than those specified in the Order. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the ?

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction and monitoring; and

4. Progress reports.

TASK II: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan shall include the following:

A. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Data Collection Quality Assurance Plan

The Respondent shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, minimum detection limits, units of measurement, calibration of instruments, accuracy and completeness of the measurement data;

c. Description of the method used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition.

Examples of factors which shall be considered and discussed include:

i) Environmental conditions at the time of sampling;

ii) Number of sampling points;

iii) Representation of selected media; and

iv) Representation of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

i) RFI data generated by the Respondent over time;

ii) RFI data generated by an outside laboratory or consultant versus data generated by the Owner/ Operator;

iii) Data generated by separate consultants or laboratories; and

iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports shall include but not be limited to:

i) Annual assessment of measurement data accuracy, precision, and completeness;

ii) Annual performance audits and results thereof;

iii) Annual system audits and results thereof;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, sampling equipment, sample containers, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., groundwater, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Measures to be taken to prevent contamination of sampling equipment and cross contamination between sampling points; and

j. Number of field blanks, trip blanks and replicates.

k. Documenting field sampling operations and procedures, including:

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate samples;

vi) Submission of field-biased blanks and trip blanks, where appropriate;

vii) Potential interferences present at the facility;

viii) Construction materials and techniques, associated with recovery wells, monitoring wells and piezometers;

ix) Field equipment listing sample containers;

x) Sampling order; and

xi) Decontamination procedures.

l. Selecting appropriate sample containers;

m. Sample preservation; and

n. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking; and,

iii) Pre-prepared seals for sample containers cross-referenced to the tracking reports.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement devices, locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and

where;

g. Selecting the frequency of field measurement and length of field measurements period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Potential interferences present at the facility;

iv) Field equipment listing;

v) Order in which field measurements were made; and

vi) Decontamination procedures.

4. Sample Analysis

Data generated for the ARFI and data generated prior to the ARFI by the Respondent may be used for meeting the requirements of the RFI.

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage and holding times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases;

x) Reagent quality control checks; and

xi) Recommended vs actual holding times for samples.

xii) Name and address of laboratory to be used for sample analysis.

h. Preventive maintenance procedures and

schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

The Respondent shall specify the name and address of the laboratory to be used for sample analysis. The Administrative Authority reserves the right to conduct a performance and QA/QC audit of the above specified laboratory before or during sample analysis. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis will be required.

C. Data Management Plan

The Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measured;

f. Result of analysis (e.g., concentration); and

g. Actual holding time of all samples, making special note of those samples which exceeded recommended holding times.

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography);

e. Temporal date (e.g., comparing sampling dates); and

f. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Displays levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors

D. Health and Safety Plan

The Respondent shall prepare a facility Health and Safety Plan. 1.

Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;

b. Describe the known hazards and evaluate the

risks associated with the incident and with each activity conducted;

c. List key personnel and alternates responsible for site safety, responses operations, and for protection of public health;

d. Delineate work area;

e. Describe levels of protection to be worn by personnel in work area;

f. Establish procedures to control site access;

g. Describe decontamination procedures for personnel and equipment;

h. Establish site emergency procedures;

i. Address emergency medical care for injuries and toxicological problems;

j. Describe requirements for an environmental surveillance program;

k. Specify any routine and special training required for responders; and

l. Establish procedures for protecting workers from weather related problems.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. EPA Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Approved Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (OERR/ERT, 1984);

f. OSHA regulations particularly in 29 CFR 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

E. Community Relations Plan

The Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK III: FACILITY INVESTIGATION

The Respondent shall conduct those investigations as necessary to protect human health and the environment to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

Investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study, when necessary. Available information does not mean experimental research.

The facility investigation activities shall when conducted follow the plans set forth in Task II. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

The Respondent shall characterize the following solid waste management units by; environmental setting, source characterization, contaminant characterization and potential receptors:

SWMU #	Name
1	Storm Water Pond (UT-T05)
2	Equalization Basin (UT-502)
3	Surge Basin (UT-D02A)
4	Emergency Pond (UT-D02B)
5	Former Deionization Pit (UT-W13)
6	Aeration Basin (UT-T06)
7	Sludge Drying Beds
8	pH Adjustment Pit
9	Primary Clarifier
10	Sludge Thickener
11	Final Clarifier
12	Sludge/Wet Well
13	Former Final Clarifier
14	Sludge Digester
15	Parshall Flume
16	Cooling Tower Blowdown Water Treatment System
17	PVC Settling Pits
18	Drum Storage Area
19	Waste Gas Incinerator/Scrubber Systems
20	Acid Storage Tank (VT-765)
21	Holding Pit for EDC Decanter Sludge (VT-640)
22	Abandoned Chemical Sewer Pit
23	VCM Process Wastewater Collection Pit (VT-630)

SWMU#	Name
24	EDC Still Bottoms Storage Tank (VT-763A)
25	EDC Still Bottoms Storage Tank (VT-763B)
26	EDC Still Bottoms Storage Tank (VV-102)
27	Lab Waste Storage Area
28	Decoking Pit
29	Deionizer Regeneration Waste Pit (UTW-14)
30	Boiler Blowdown Sump (UT-B04)
31	Used Oil Storage Area
32	Empty Container Storage Area
33	Chemical Sewer System
34	Storm Sewer System
35	Secondary Containment; EDC Product Tank (VT-732)

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at and around the facility.

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:

i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, etc.);

iii) Depositional history;

iv) Regional and facility specific groundwater flow patterns, sufficient to reflect seasonal changes in flow patterns; and;

v) Identification and characterization of

areas and amounts of recharge and discharge, sufficient to reflect seasonal variations.

b. An analysis of any topographic features that might influence the groundwater flow system (e.g., area of swamps, seeps and creeks. (Note: Stereoscopic analysis of aerial photographs may aid in this analysis.

c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

i) Hydraulic conductivity and porosity (total and effective);

ii) Lithology, grain size, sorting, degree of cementation;

iii) An interpretation of hydraulic interconnections between saturated zones; and

iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, North-South and East-West oriented structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

i) Zones of desiccation, fracturing, slickensides or channeling in consolidated or unconsolidated deposits;

ii) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;

e. Based on data obtained from all groundwater monitoring wells, and piezometers installed upgradient and down-gradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i) The flow system, including the vertical

and horizontal components of flow; and

ii) Any temporal changes in hydraulic gradients, for example, due to seasonal influences or tidal influences.

f. A description of man-made influences that may affect the hydrogeology of the site, identifying:

i) Artificial penetrations within a one-mile radius of the site, including any available logs, construction details, and method of abandonment, if inactive, and

ii) Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

a. USCS soil classification;
b. Surface soil distribution;
c. Directional relative permeability;
d. Bulk density;
e. Cation exchange capacity (CEC);
f. Soil pH;
g. Particle size distribution;
h. Moisture content;
i. Infiltration;
j. Storage capacity; and
k. Mineral content.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility using available data. Such characterization shall include, but not be limited to, the following activities and information:

a. A description of the temporal and permanent surface water bodies for a radius of at least one mile from facility, including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For streams, ditches, drains, swamps, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);

iii) Drainage patterns;

iv) Evapotranspiration rates; and

v) Interaction between surface water bodies and groundwater.

b. Description of the chemistry of the natural (i.e., background) surface water and sediments. This includes pH, total dissolved solids, total suspended solids, biochemical oxygen demand (BOD_5 and BOD_{20}), alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations as proposed by Respondent and approved by EPA.

c. Description of sediment characteristics including:

i) Deposition area;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

In order to determine the existing impact, if any, or the impact, if any, during the CMS and CMI on the surrounding environment of such contaminants as may be emanating from the facility by air, the following data shall be collected:

a. The Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

A. Description using available data of the

following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description using available data of topographic and man-made features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Wind breaks and forests; and

iii) Buildings.

c. Characterizations of:

i) ambient air quality at the facility;

ii) fugitive air emissions from the facility;

iii) background air quality.

These characterizations will consist of comprehensive screening of hazardous waste constituents which may be transported by air from the facility, and concentrations found. After air quality is characterized, Respondent shall submit an air monitoring plan to be used during the CMS and CMI which shall list identified constituents, proposed detection limits for each constituent, and proposed allowable concentrations for each constituent for EPA approval.

B. Source Characterization

Using available data, the Respondent shall collect analytic data to completely characterize the wastes and the areas where wastes have been placed, collected, or removed (e.g., landfills, surface water retention areas, etc.) including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each SWMU:

1. Unit/Disposal Area characteristics:

   a. Location of unit/disposal area;
   b. Type of unit/disposal area;
   c. Design features;
   d. Operating practices (past and present);
   e. Period of operation;
   f. Age of unit/disposal area;
   g. General physical conditions; and
   h. Method used to close the unit/disposal area.

2. Waste Characteristics:

   a. Type of waste placed in the unit;

      i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

      ii) Quantity; and

      iii) Chemical composition.

   b. Physical and chemical characteristics;

      i) Physical form (solid, liquid, gas);

      ii) Physical description (e.g., powder, oily sludge);

      iii) Temperature;

      iv) pH;

      v) General chemical class (e.g., acid, base, solvent);

      vi) Molecular weight;

vii) Density;

viii) Flash point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the waste; and

xii) Vapor pressure.

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

The Respondent shall collect analytical data on groundwater, soil, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the vertical and horizontal extent, origin, direction, and rate of migration of contaminant plumes. The data shall include time and location of sampling, media sampled, concentrations detected, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Groundwater Contamination

The Respondent shall conduct a Groundwater Investigation to characterize any plumes of contamination at the facility,

This investigation shall at a minimum provide the

following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contaminant movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix IX constituents in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the vadose zone in the vicinity of the facility site. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination. Description may be based on soil-gas analysis, soil sampling program or some combination. The soil-gas analysis, if chosen, should include:

i) A description of the horizontal and vertical extent of subsurface gas migration;

ii) The chemical composition of the gases being emitted;

iii) The rate, amount, and density of the gases being emitted; and

iv) Horizontal and vertical concentration profiles of the subsurface gases emitted.

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility,

speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct an investigation to characterize contamination of surface water and sediment at the point of surface drainage from the facility as described in the ARFI Work Plan, Task III.

The Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall evaluate the data collected under Task III.A.4. of the RFI and determine the concentration of any listed constituent(s) emanating from the Facility, and the point of origin of the constituent(s) from within the Facility.

D. Potential Receptors

The Respondent shall collect available data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems (e.g., stressed vegetation) may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:

a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

b. Location and names of groundwater users and past users since 1970, within a three-mile radius down-gradient and one half mile radius up-gradient, including wells and discharge

areas.

✓ 2. Local uses and possible future uses of surface waters receiving drainage from the Facility within 1.5-miles down stream of the facility:

a. Domestic and municipal (e.g. potable and lawn/gardening watering);

b. Recreational (e.g. swimming, fishing);

c. Agricultural;

d. Industrial; and

e. Environmental (e.g. fish and wildlife propagation).

✓ 3. Human use of or access to the facility and adjacent lands, including but not limited to:

a. Recreation;

b. Hunting;

c. Residential;

d. Commercial;

e. Zoning; and

f. Relationship between population locations and prevailing wind direction.

✓ 4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

✓ 5. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.

✓ 6. A description of any endangered or threatened species near the facility.

TASK IV: INVESTIGATIVE ANALYSIS

The Respondent shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

The Respondent shall analyze all facility investigation data outlined in Task III and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area.

B. Protection Standards

1. Groundwater Protection Standards

For all regulated units, the Respondent shall provide information to support EPA's selection/development of Groundwater Protection Standards for all of the Appendix IX constituents found in the groundwater during the Facility Investigation (Task III).

a. The Groundwater Protection Standards shall consist of:

i) for any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in that table (MCL) if the background level of the constituent is below that given in Table 1;

ii) the background level of the constituent in the groundwater; or

iii) an Alternate Concentration Limit (ACL) approved by EPA.

b. Information to support EPA's subsequent selection of an ACL shall be developed by the Respondent in accordance with USEPA guidance. For any proposed ACLs, the Respondent shall include a justification based upon the criteria set forth in 40 CFR §264.94(b).

c. Within ninety (90) days of receipt of any proposed ACLs, EPA will notify the Respondent in writing of approval, disapproval or modifications of the proposed ACL. EPA will specify in writing the reason(s) for any disapproval or modification.

d. Within sixty (60) days of receipt of EPA's notification, the Respondent shall resubmit the amended ACL's to EPA.

2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally-approved State water quality standards, etc.).

TASK V: LABORATORY AND BENCH-SCALE STUDIES

Based on the Current Conditions Report and ongoing investigation, the Respondent shall conduct laboratory or bench-scale studies, or technological review studies, to determine the applicability of a corrective measure technology or technologies to the facility conditions. The Respondent shall analyze the technologies, based on literature review, vendor contacts, and past experience to determine the testing requirements.

The Respondent shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of testing, the Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Respondent shall prepare a report summarizing the testing program or technology review and the results, both positive and negative, and submit it to EPA and TWC for review and EPA approval concurrently with the Final RFI Report.

TASK VI: REPORTS

A. Preliminary and Workplan

The Respondent shall submit to EPA and TWC for EPA approval the Preliminary Report (Task I) and the RCRA Facility Investigation Workplan (Task II) as described in the Final Order.

B. Progress

The Respondent shall at a minimum provide EPA and TWC with signed, progress reports every two months containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of all findings from the reporting period;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts (pertaining to this program) with representatives of the local community, public interest groups or State government during the reporting period.

5. Summaries of all problems or potential problems encountered during the reporting period.

6. Actions being taken to rectify problems;

7. Changes in key personnel associated with this project and plant management during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of items such as daily reports, inspection reports, laboratory/monitoring data, etc.

10. Status of each interim measure required by Section IX.A.2. of the Final Order and copies of any data generated by the interim measures required by this Final Order.

C. Draft and Final

Upon EPA approval of the RFI Workplan, the Respondent

shall initiate the RFI. Upon conclusion of the RFI, the RFI Report shall be developed in draft form for U.S. EPA review. The Report shall be developed in final format and shall address to EPA's satisfaction each of EPA's comments received on the Draft RFI Report. Task V shall be submitted as a separate report when the Final RFI Report is submitted. Six copies of all reports shall be submitted. Revised Draft RFI Reports will be due within 30 days after receipt of EPA comments on the previous draft. If EPA determines that the Draft or Final RFI Report is grossly deficient, the Respondent will be so notified and deemed to be out of compliance with this Order.

Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

Facility Submission	Due Date
Description of Current Situation (Task I)	30 Days *
RFI Workplan (Task II)	90 days *
Draft RFI Report (Tasks III and IV)	365 days after RFI Workplan Approval
Final RFI Report (Tasks III and IV)	90 days after EPA comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task V)	Concurrent with Final RFI Report
Progress Reports on Interim Measures and Tasks I through V	Every month *

* Dates are calculated from the effective date of this order.

IV

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY (CMS) AT FORMOSA PLASTICS CORPORATION POINT COMFORT, TEXAS

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Formosa Plastics Corporation. Upon review and approval of the Final CMS report by EPA, a proposed remedy(ies) shall be selected by EPA and presented to the public for comment. Upon evaluation of, and response to, public comment, a Final Remedy(ies) shall be selected by EPA for implementation by the Respondent. This remedy(ies) shall either be in the form of a second Order to the Respondent or modification to Respondent's HSWA permit with Corrective Measure Implementation requirements. The Respondent will furnish the personnel, materials, and services necessary to prepare the CMS, except as otherwise specified.

SCOPE

The Corrective Measure Study consists of four tasks:

Task VII: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task VIII: Evaluation of the Corrective Measure Alternative(s)

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimates

Task IX: Justification and Recommendation of the Corrective Measure or Measures

- A. Technical
- B. Human Health
- C. Environmental

Task X: Reports

- A. Progress

B. Draft
C. Final

TASK VII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation (RFI) and consideration of the identified Preliminary Corrective Measure Technologies (Task I) the Respondent shall identify, screen, and develop the alternative(s) for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Respondent shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RFI report. The Respondent shall provide an update to information presented in Task I of the RFI to the EPA regarding previous response activities and any interim measures which have or are being implemented at the facility. The Respondent shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent, in conjunction with EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environment criteria, information gathered during the RCRA Facility Investigation, EPA guidance and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR §264.100.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the RFI and assess all potential technologies which are applicable to the facility. The Respondent shall eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitiations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to

screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should
be eliminated from further consideration;

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be elimated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

The level of technology development, performance record, and inherent construction, operation and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. <u>Identification of the Corrective Measure Alternatives</u>

The Respondent shall develop the corrective measure alternatives based on the corrective measure objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task VII C. of the RFI as supplemented following the preparation of the RFI report. The Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternatives. The alternatives developed should represent a workable number of options that each appear to adequately address all site problems and corrective action objectives. The alternatives developed shall include, but are not limited to source removal, impoundment closure, pump and treat remediation, and enhanced bioremediation. Each alternative may consist of an individual technology or a combination of technologies. The Respondent shall document the reasons for excluding technologies, identified in Task VII C., as supplemented in the development of the alternative.

TASK VIII: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passed the Initial Screening in Task VII and evaluate each corrective measure alternative and it's components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Respondent shall also develop cost estimates for each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the four following areas:

1. Technical

   a. The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

      i) Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. All waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

      ii) Useful life is defined as the length of time the level of effectivness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service life, the appropriateness of the technologies.

   b. The Respondent shall provide information on the reliability of each corrective measure including their operation and maintenance requirements, and their demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructibility) and the time required to achieve a given level of response:

i) Constructibility is determined by conditions both internal and external to the facility conditions, and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities;

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. The Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall

include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include fire, explosion, and exposure to hazardous substances.

2. Environmental

The Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive area; and an analysis of measures to mitigate adverse impacts.

3. Human Health

The Respondent shall assess each alternative in terms of the extent which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminant on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative and existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional

The Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. <u>Cost Estimate</u>

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include capital, and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

a. Direct capital costs include:

i) Construction costs: Cost of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure alternative.

ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is completed;

iii) Land and site development costs: Expenses associated with purchase of land and development of existing property; and

iv) Building and services costs: Costs of process and nonprocess buldings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i) Engineering expenses: Costs of administration, design construction supervision, drafting, and testing of corrective measure alternatives;

ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

iv) Contingency allowances: Funds to cover resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction cost necessary to ensure continued effectivness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operation;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues generated during operation;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds; Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs: and

i. Other costs: Items that do not fit any of the above categories.

TASK IX: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environment criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pretinent factors shall be highlighted. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks VIII and IX. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures are most effective at performing their intended function and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and have proven effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) on the environment over the shortest period of time will be favored.

TASK X: REPORTS

The Respondent shall prepare a Corrective Measure Study Report presenting the results of Task VII through IX recommending a corrective measure alternative. Five (5) copies of the draft and final reports shall be provided to EPA by the Respondent.

A. Progress

The Respondent shall at a minimum provide EPA with signed progress reports every two months containing:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings during the reporting period;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period.

5. Summaries of all problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in key personnel associated with the CMS and plant management during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

The Report shall at a minimum include:

1. A summary of the corrective measure or measures and rationale

a. Description of the corrective measure or measures and rational for selection;

b. Performance expectation;

c. Preliminary design criteria and rationale;

d. General operation and maintenance requirements;

e. Long-term monitoring requirements

2. Design and Implementation Precautions:

a. Special technical problems;

b. Additional engineering data required;

c. Permits and regulatory requirements;

d. Access, easements, right-of-way;

e. Health and safety requirements; and

f. Community relations activities.

3. Cost Estimates and Schedules:

a. Capital cost estimates;

b. Operation and maintenance cost estimate; and

c. Project schedule (design, construction, operation).

C. Final

The Respondent shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Progress Reports on Tasks VII, VIII, and IX	Every two months
Draft CMS Report (Tasks VII, VIII, and IX)	180 days after approval of the Final RFI
Final CMS Report (Tasks VII, VIII, and IX)	45 days after EPA comment on the Draft CMS

SCOPE OF WORK FOR THE CORRECTIVE MEASURE IMPLEMENTATION (CMI) AT FORMOSA PLASTICS CORPORATION

PURPOSE

The purpose of this Corrective Measure Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected to protect human health and the environment. Formosa Plastics Corporation will furnish all personnel, materials and services necessary for the implementation of the corrective measure or measures.

SCOPE

The Corrective Measure Implementation program consists of four tasks:

Task XI: Corrective Measure Implementation Program Plan

- A. Program Management Plan
- B. Community Relations Plan

Task XII: Corrective Measure Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Cost Estimate
- D. Project Schedule
- E. Construction Quality Assurance Objectives
- F. Health and Safety Plan
- G. Design Phases

Task XIII: Corrective Measure Construction

- A. Responsibility and Authority
- B. Construction Quality Assurance Personnel Qualifications
- C. Inspection Activities
- D. Sampling Requirements
- E. Documentation

Task XIV: Reports

- A. Progress
- B. Draft
- C. Final

TASK XI: CORRECTIVE MEASURE IMPLEMENTATION PROGRAM PLAN

Formosa Plastics Corporation shall prepare a Corrective Measure Implementation Program Plan. This program will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The Program Plan includes the following:

A. Program Management Plan

Formosa Plastics Corporation shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of corrective measure(s). The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The Program Management Plan will also include a description of qualifications of key personnel directing the Corrective Measure Implementation Program, including contractor personnel.

B. Community Relations Plan

Formosa Plastics Corporation shall revise the Community Relations Plan to include any changes in the level of concern of information needs to the community during design and construction activities.

1. Specific activities which must be conducted during the design stage are the following:

   a. Revise the facility Community Relations Plan to reflect knowledge of citizen concerns and involvement at this stage of the process; and

   b. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

2. Specific activities to be conducted during the construction stage could be the following: Depending on citizen interest at a facility at this point in the corrective action process, community relations activities could range from group meetings to fact sheets on the technical status.

TASK XII; CORRECTIVE MEASURE DESIGN

Formosa Plastics Corporation shall prepare final construction plans specifications to implement the corrective measure(s) at the facility as defined in the Corrective Measure Study.

A. Design Plans and Specifications

Formosa Plastics Corporation shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:

   a. Compliance with all applicable or relevant environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

   a. Use of currently accepted environmental control measures and technology;

   b. The constructability of the design; and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. Discussion of the possible source of error and references to possible operation and maintenance problems;

5. Detailed drawings of the proposed design including:

   a. Qualitative flow sheets; and

   b. Quantitative flow sheets.

6. Tables listing equipment and specifications;

7. Tables giving material and energy balances;

8. Appendices including:

   a. Sample calculations (one example presented and

explained clearly for significant or unique design calculations);

b. Derivation of equations essential to understanding the report; and

c. Results of laboratory and/or field tests.

B. Operation and Maintenance Plan

Formosa Plastics Corporation shall prepare an Operation and Maintenance Plan to cover both implementation and long term maintenance of the corrective measure. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance (O&M);

a. Description of tasks for operation;

b. Description of tasks for maintenance;

c. Description of prescribed treatment or operation conditions; and

d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems;

a. Description and analysis of potential operation problems;
b. Sources of information regarding problems; and

c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

a. Description of monitoring tasks;

b. Description of required laboratory tests and their interpretation;

c. Required QA/QC; and

d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M;

a. Should systems fail, alternate procedures to prevent undue hazard; and

b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan;

a. Description of precautions, of necessary equipment, etc., for site personnel; and

b. Safety tasks required in event of systems failure.

6. Description of equipment; and

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

7. Records and reporting mechanisms required.

a. Daily operating logs;

b. Laboratory records;

c. Records for operating costs;

d. Mechanism for reporting emergencies;

e. Personnel and maintenance records; and

f. Quarterly/annual summary reports to State agencies.

An initial Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design Document submission and the Final Operation and Maintenance Plan with the Final Design Documents.

C. Cost Estimate

Formosa Plastics Corporation shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall

include both capital and operation and maintenance costs. An initial Cost Estimate shall be submitted simultaneously with the Prefinal Design Document submission and the Final Cost Estimate with the Final Design Documents.

D. Project Schedule

Formosa Plastics Corporation shall develop a detailed Project Schedule for construction and implementation of the corrective measure(s) which identifies timing for initiation and completion of all critical path tasks. Formosa Plastics Corporation shall specifically identify dates for completion of the project and major interim milestones which shall be enforceable terms of this order. An initial Project Schedule shall be submitted simultaneously with the Prefinal Design Document submissions and the Final Project schedule with the Final Design Document.

E. Construction Quality Assurance Objectives

Formosa Plastics Corporation shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

F. Health and Safety Plan

Formosa Plastics Corporation shall modify the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measure(s).

G. Design phases

The design of the corrective measure(s) should include the phases outlined below.

1. Preliminary design

Formosa Plastics Corporation shall submit the Preliminary design when the design effort is approximately 30% complete. At this stage Formosa Plastics Corporation shall have field verified the existing conditions of the facility. The preliminary design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will

provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawing by Formosa Plastics Corporation shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. Formosa Plastics Corporation shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

2. Intermediate design

Complex project design may necessitate review of the design documents between the preliminary and the prefinal/final design. At the discretion of the Agency, a design review may be required at 60% completion of the project. The intermediate design submittal should include the same elements as the prefinal design.

3. Correlating plans and specifications

General correlation between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, Formosa Plastics Corporation shall:

a. Coordinate and cross-check the specifications and drawings; and

b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95% prefinal submittal to the Agency.

4. Equipment start-up and operator training

Formosa Plastics Corporation shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and operation of the treatment systems; and training covering appropriate operational procedures once the startup has been successfully accomplished.

5. Additional studies

Corrective Measure Implementation may require additional studies to supplement the available technical data. At the direction of the Agency for any such studies required, Formosa Plastics Corporation shall furnish all services, including field work as required, materials, supplies, plant, labor, equipment, investigations, studies and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, role of personnel involved and orientation of the site, etc. The interim report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

6. Prefinal and final design

Formosa Plastics Corporation shall submit the prefinal/Final design documents in two parts. The first submission shall be at 95% completion of design (i.e., prefinal). After approval of the prefinal submission, Formosa Plastics Corporation shall execute the required revisions and submit the final documents 100% complete with reproducible drawings and specifications.

The prefinal design submittal shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Cost Estimate, Quality Assurance Plan and Specifications for the Health and Safety Plan and Project Schedule.

The final design submittal shall consist of the Final Design Plans and Specifications (100% complete), Formosa Plastics Corporation's Final Construction Cost Estimate, the Final Draft Operation and Maintenance Plan, Final (Quality Assurance Plan and Health and Safety Plan specifications). The quality of the design documents should be such that Formosa Plastics

Corporation would be able to include them in a bid package and invite contractors to submit bids for the construction project.

TASK XIII: CORRECTIVE MEASURE CONSTRUCTION

Following EPA approval of the final design, Formosa Plastics Corporation shall develop and implement a construction quality assurance (CQA) program to ensure, with a reasonable degree of certainty, that a completed corrective measure(s) meets or exceeds all design criteria, plans and specifications. The CQA plan is a facility specific document which must be submitted to the Agency for approval prior to the start of construction. At a minimum, the CQA plan should include the elements which are summarized below. Upon EPA approval of the CQA Plan Formosa Plastics Corporation shall construct and implement the corrective measures in accordance with the approved design, schedule and the CQA Plan. Formosa Plastics Corporation shall also carry out all elements of the approved Operation and Maintenance Plan.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure shall be described fully in the CQA plan. Formosa Plastics Corporation must identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e..g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, Formosa Plastics Corporation shall conduct the following activities:

1. Preconstruction inspection and meeting with EPA to:

   a. Review methods for documenting and reporting

inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion Formosa Plastics Corporation shall notify EPA for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the EPA approved corrective measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by Formosa Plastics Corporation. Formosa Plastics Corporation will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final Inspection

Upon completion of any outstanding construction items, Formosa Plastics Corporation shall notify EPA for the purposes of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with

the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This should include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK XIV: REPORTS

Formosa Plastics Corporation shall prepare plans, specifications, and reports as set forth in Tasks XI through Task XIII to document the design, construction, operation, maintenance and monitoring of the corrective measure. The documentation shall include, but not be limited to the following:

A. Progress

The Respondent shall at a minimum provide the EPA with progress reports signed by the plant; every two months, with the first report due two months after submittal of teh Final CMS Report, containing:

1. A description and estimate of the percentage of the CMI completed;

2. Summaries of all findings and data, during the reporting period;

3. Summaries of all changes made in the CMI during the reporting period;

4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel associated with corrective measures and plant management during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

1. Formosa Plastics Corporation shall submit a draft Corrective Measure Implementation Program Plan as outlined in Task XI;

2. Formosa Plastics Corporation shall submit draft Construction Plans and Specifications, Design Reports, Project Schedule, Operation and Maintenance Plan, and Study Reports as outlined in Task XII;

3. Formosa Plastics Corporation shall submit a draft Construction Quality Assurance Program Plan and Documentation as outlined in Task XIII; and

4. At the "completion" of the construction of the project, Formosa Plastics Corporation shall submit a Corrective Measure Implementation Report to the Agency. The Report shall document that the project is consistent with the design specifications, and that the corrective measure is performing adequately. The Report shall include, but not be limited to the following elements:

   a. Synopsis of the corrective measure and certification of the design and construction;

   b. Explanation of any modifications to the plans and why these were necessary for the project;

   c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modifications to these criteria;

   d. Results of facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria; and

   e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report should include all of the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings, and any other pertinant documentation not previously provided which would serve to compile a completed report.

C. Final

Formosa Plastics Corporation shall finalize the Corrective Measure Implementation Program Plan, Construction Plans and Specifications, Design, Reports, Operation and Maintenance Plan, Project Schedule Study Reports, Construction QA Program Plan/Documentation, Additional Studies Report and the Corrective Measure

Implementation Report incorporating comments received on draft submissions.

Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Implementation Scope of Work is present below:

Facility Submission	Due Date
Draft Program Plans (Task XI)	Concurrent with Final CMS Report RMP
Final Program Plans (Task XI)	15 days after EPA comment on Draft Program Plans
Design Phases (Task XII A)	
-Preliminary Design	(30% completion)
-Intermediate Design	(60% completion)
-Prefinal Design	(95% completion) 120 days after submittal of Final Program Plan
-Final Design (100% completion)	30 days after EPA approval of Prefinal Design
(Task XII B through G)	
-Draft Submittals	Concurrent with Prefinal Design
-Final Submittals	Concurrent with Final Design
Additional Studies: Interim Report (Task XII G)	[Date Established Prior to Final Design]
Additional Studies: Final Report (Task XX G)	15 days after EPA comment on Interim Report
Draft Construction Quality Assurance Plan (Task XIII)	With Final Design
Final Construction Quality Assurance (Task XIII)	15 days after EPA Plan approval comment on Draft Construction Quality Assurance Plan
Construction of Corrective Measures	As approved in Final Design upon approval of Final CQA plan
Prefinal Inspection Report (Task XIII)	15 days after Prefinal Inspection

Facility Submission	Due Date
Draft CMI Report (Task XIV)	Upon completion of construction phase
Final CMI Report (Task XIV)	15 days after EPA comment on Draft CMI Report
Progress Reports for Task XI through Task XIII	Every Two months (1)
Progress Reports during operation and Maintenance	Semi-Annual (2)

(1) The first Report will be due sixty (60) days after submittal of the Final CMS Report.

(2) The first semi-annual report will be due six (6) months after the Final Inspection by EPA is complete.